



Literacy



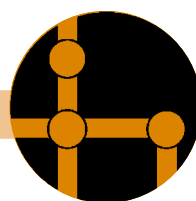
Access



Content



Diversity



Infrastructure



Literacy

Just as the ability to read is integral to basic survival and achievement, the ability to use computers and the Internet is becoming fundamental to participating and working in society.

Information technology literacy relies on exposure to use and how time with the tools is spent. This set of indicators measures residents' comfort with computing and Internet tasks, then goes beyond that to look at fluency. It also considers the nature and importance of tasks performed during time spent with the tools. Are people able to apply technology to complete desired tasks? How important are computers and the Internet for accomplishing these? These are reflections of applied literacy as well as quality of life indicators.

The public school system may be the most critical stage for developing a technology healthy future. The education system indicators included here present a snapshot of the Seattle Public Schools system as it works to achieve its goals of building the infrastructure and implementing the planning, training and programming necessary to enable a technology sound education system. Additional data on education, including academic interest in IT careers and higher education, is included in the Business and Economic Development section of this report. A significant amount of information technology education occurs on the job or in other training programs outside traditional educational institutions. Adult education and lifelong learning programs also provide valuable information technology literacy opportunities. However we were not able to capture a measure for these.

Information Technology Patterns of Use

Having a computer to use is not enough to create healthy access—residents need to have regular opportunities to use computers and the Internet to build their skills and meet their personal and professional needs. Regular computer usage improves skills and literacy levels and creates opportunities for residents to find new applications for computers and the Internet that support their day to day activities. However, time spent on the computer may be time that otherwise would be spent with friends, family, or in the community. The balance between sufficient access and excessive access can be measured by looking at satisfaction with the amount of time spent on computers and the Internet. Healthy usage means that residents feel they are meeting their computer and Internet needs by not spending too much or too little time logged on.

Measurements

Hours spent on the computer per week	28
Percent of that time spent on the Internet	25%
Percent of residents who would like to use the computer more than they currently do	28%
Percent of residents who would like to use the Internet more than they currently do	33%

On average¹, residents with computer access spend 28 hours a week on the computer.

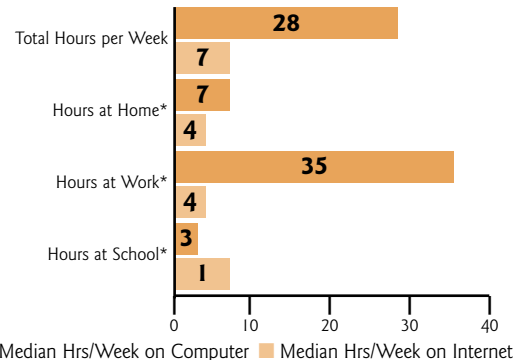
This amount of time is a combination of all locations where computers are used, including work, school, home and other locations. Those who access the computer at work spend far more time on that computer than those who access at home, school or other locations.

About seven hours per week are spent on the Internet, which is equivalent to one-quarter of the time spent on the computer. Home computer usage has the largest influence on the amount of time spent on the Internet. Those who use a computer at home spend more than half of their home computer time on the Internet. In comparison, those who use a computer at work spend only about 10 percent of their work computer time on the Internet.

Despite heavy usage of the Internet, many Seattleites are not getting to spend as much time online as they would like.

One-third (33%) of all respondents would like to use the Internet more. Those with access to

TIME SPENT ON THE COMPUTER AND INTERNET PER WEEK

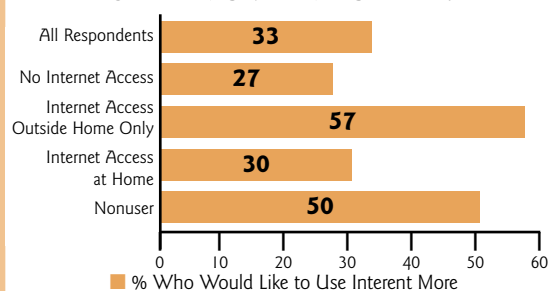


*Hours at home, work, and school are based only on those respondents who use computers or the Internet in these respective locations—i.e., hours at home is based on those with a computer/Internet at home, hours at work is based on those who use a computer/Internet at work, and hours at school is based on those who use a computer/Internet at school.

Source: 2000 Seattle IT Residential Survey

the Net only outside the home are the most likely to want to spend more time online, with almost three out of five (57%) saying they would like to use the Internet more. Half of those who have access to the Internet but don't use it say that they would like to use it more.

WHO WOULD LIKE TO SPEND MORE TIME ONLINE?



Source: 2000 Seattle IT Residential Survey

Use of Computers and Internet for Personal Tasks

Technology will change over time, so it is important to understand how these tools are being utilized and what value they hold for individual's personal needs. The importance of computers and the Internet for completing daily tasks is indicative of the role that computers currently play in residents' lives. Changes in usage over time helps to track changing influences on the development of computers and the Internet.



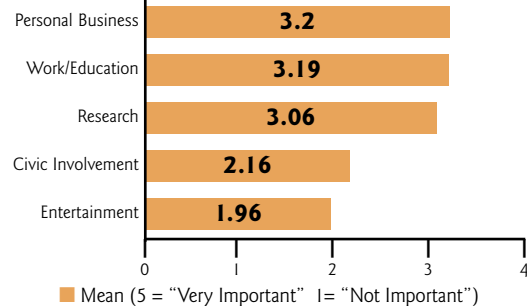
Seattle residents find computers to be very useful for a wide-range of communication, work, and research-related tasks.

Analysis from the Seattle Information Technology Survey shows that computers and the Internet are most important to residents for personal business (e-mail, travel research and planning, managing finances, and researching products and services) and work/education related tasks (work tasks, homework, and starting or maintaining a business). Research tasks such as learning about current events, researching hobbies, and looking for health information are rated almost equally as important.

Computers and the Internet are least important to residents for entertainment related tasks, such as playing games, researching entertainment or sports, and visiting chat rooms.

In general, the ten most popular uses of computers and the Internet for Seattle residents are very similar to what has been found in national studies. In all national studies, the Internet is found to be extremely popular for personal communication and research tasks (e-mail, instant messaging, hobby information, travel information, medical information).²

IMPORTANCE OF MAJOR COMPUTER TASKS



Source: 2000 Seattle IT Residential Survey

TOP TEN MOST POPULAR USES OF COMPUTERS AND THE INTERNET

- 1 E-mail or instant messaging
- 2 Work-related tasks
- 3 Research or gathering information about hobbies
- 4 Educational purposes or homework
- 5 Find news about travel or make travel arrangements
- 6 Gather information about products or services you might wish to purchase
- 7 Learn about current events
- 8 Manage finances
- 9 Get health or medical information
- 10 Search for jobs

Source: 2000 Seattle IT Residential Survey

Information Technology Literacy

In order to ensure participation in community, work and civic life, there is an increasing need for all residents to meet a basic standard of computer and Internet literacy. Defining and measuring basic technology literacy for residents is an important step in shifting the conversation from the subject of technology access towards the subject of technology skills and knowledge. There is currently no universally accepted definition of the basic set of computer and Internet skills that residents should master in order to be considered computer literate. There are varying levels of technological expertise, so the challenge is to recognize all these levels and pull from them the basic standard for competency.

Measurements

Comfort with basic computer tasks (Scale of 1–5 where 5 is very comfortable)	4.59
Comfort with more advanced computer tasks	3.59
Comfort with basic Internet tasks	4.28
Comfort with more advanced Internet tasks	3.19

Overall, residents are very comfortable with both basic and more advanced computer tasks.

There is no significant difference in comfort with basic tasks between men and women. However, men are significantly more comfortable with advanced computer tasks than are women.

- Those residents 65 and older are significantly less comfortable with both basic and advanced computer tasks than any other age group.
- Those with four-year college degrees are more likely to be comfortable with both basic and advanced computer tasks than those without college degrees.
- Caucasians and, to a lesser extent, Asian-Americans are more likely than African-Americans and Hispanics to say they are comfortable with basic computing tasks. Hispanics are the least comfortable with using the computer for advanced computing tasks.
- Using a computer at work has the greatest influence on comfort with both basic and advanced computer tasks, followed by those who have access at home.

Computer Tasks

Computer Tasks	Mean Score
BASIC TASKS—OVERALL SCORE	4.59
Navigating using a mouse	4.58
Saving a file	4.47
Opening a saved file	4.47
Typing, editing and printing a document	4.38
ADVANCED TASKS—OVERALL SCORE	3.59
Installing new software	3.67
Creating a simple budget using a spreadsheet program	3.63
Adding or changing a peripheral	3.56
Creating a flyer	3.41
Setting up a new computer	3.29
Scanning and editing images	3.24

Internet Tasks

Internet Tasks	Mean Score
BASIC TASKS—OVERALL MEAN	4.28
Replying to an e-mail message	4.57
Creating and sending an e-mail message	4.54
Sending and opening e-mail attachments	4.17
Finding and retrieving information on the web	4.09
Downloading files from the Internet	3.90
ADVANCED TASKS—OVERALL MEAN	3.19
Signing up or removing oneself from a distribution list	3.84
Setting up a new Internet connection	3.36
Creating a website	2.49

Source: 2000 Seattle IT Residential Survey



Residents are very comfortable with basic Internet skills and less comfortable with more advanced skills, although the average user still rated their comfort above a three on all tasks except creating a web site.

- Comfort with basic and advanced Internet tasks breaks down along the same demographics as comfort with computer basic and advanced computer tasks.
- Those who have access to the Internet at work were most likely to score highest on comfort with advanced Internet tasks.

Fluency

In 1999, the Computer Science and Telecommunications Board of the National Research Council commissioned a study to define the technology skills that citizens need to participate in the Information Age. This study found that in order to use technology effectively today and in the future, citizens must move beyond basic computer literacy and be able to acquire new skills independently after formal education is complete. “Fluency” refers to this ability to continually apply knowledge about technology to adapt to change and acquire more knowledge to effectively apply information technology to work and personal needs.³ Fluency with information technology is a proxy for residents’ ability to effectively participate in the information age, even as technologies and personal needs change over time.

Measurements

Percentage of Seattle residents who can be considered fluent **63%**
 Fluency index for all computer-users **5**

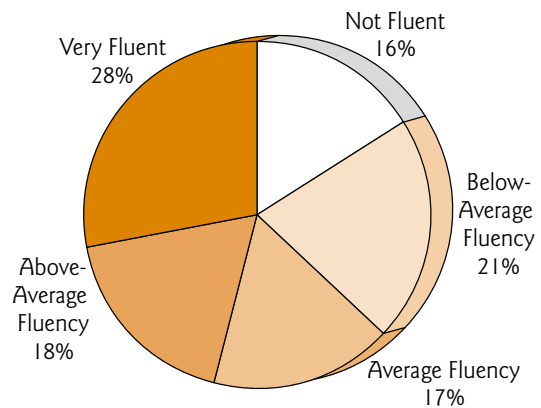
In consultation with Dr. Lawrence Snyder, University of Washington professor and chair of the Committee on Information Technology Literacy of the Computer Science and Telecommunications Board of the National Research Council, three questions were developed for surveying residents on their level of information technology fluency. Residents surveyed were asked to indicate the number of times in the past year that they had (1) personally learned a new program or computer application, (2) helped someone else get started using computers or the Internet, and (3) helped someone else learn a new program or computer application. These three measures were combined and averaged to create a fluency index. Responses to these three questions give us an indication of residents’ ability to apply knowledge of information technology in a new situation or to acquire a new technological skill. According to Dr. Snyder, any computer user who is learning and helping others an average of more than three times a year should be considered “fluent” with information technology.

Almost two-thirds (63%) of computer users can be considered fluent on the computer.

- Those that are Very Fluent have personally learned a new program or application or

FLUENCY SEGMENTS

(BASE: Computer Users)



Source: 2000 Seattle IT Residential Survey

helped others from as few as 12 times in the past year to nearly 300 times. The average (as measured by the median) is 23.

- Those that are Above-Average Fluency have learned or helped others an average of eight times.
- Those that are Average Fluency have learned or helped others an average of five times, while those that are Below-Average Fluency have only learned or helped others an average of two times.

There are some divides in fluency based on demographics.

- Men are significantly more likely than women to be very fluent or above-average in fluency—49 percent compared with 36

percent, respectively. On the other hand, more than two out of five (42%) women are not fluent or below-average in fluency.

- Fluency decreases with age with those between the ages of 18 and 25 being the most fluent.
- Asian-Americans, African-Americans and Hispanics are all more likely than Caucasians to have above-average computer fluency. This may suggest that given access to a computer, these groups make a greater effort to learn and help others.

Rainier Vista Jobs Plus

Building Computer Literacy in a Diverse Community

No matter how you pronounce it, “Good Luck” means encouragement. And that is the message conveyed as you walk through the door of the Rainier Vista Jobs Plus computer lab. Glance up, and you’ll see that sentiment in at least 20 languages, plastered across the walls of the lab. The signs were created by lab users to make all who enter feel welcome, valued and respected.

The Jobs Plus center serves a diverse, low-income community composed, mostly, of ESL refugees and immigrants, ages 10 to 84. Native languages include, among others, Amharic, Tigrinya, Oromo, Somali, Arabic, Kiswahili, Vietnamese, Khmer, Hmong, Thai and Chinese. The lab is part of Rainier Vista, a 496-unit garden community housing project with approximately 1200 residents. Of these, about 216 households speak no English. Their average yearly income, \$10,898.

The Rainier Vista Jobs Plus computer lab was opened in 1998 by the Rainier Vista Leadership Team (RVLT), a non-profit residents’ council. The lab is open five days a week and has matched more than 200 jobs with resident job hunters. First matched to entry level jobs, workers are next encouraged to focus on landing career path jobs with increased pay and benefits through the Job Upgrades program. The inclusion of the lab in their job program recognizes that computer skills are critical to a career pathway.

A Unique Community

Getting residents to take advantage of the Jobs Plus resources is not always easy. Because of this resistance, residents are offered a two-year rent freeze or rent reduction for enrolling at Jobs Plus. Seventy-five percent of the participants are women, because computing is equated with clerical work in many countries represented at the center. Clerical work is seen as “women’s work.” “The few adult men who show up are likely to want to learn accounting software,” said Job counselor and technology coordinator Rhonda Allison.

Youth are very prevalent lab users. During this writer’s visit, several Southeast Asian teens were at the site, working on a very professional looking newsletter. They are part of Kids Promoting Assets Across Cultures (PAAC). A Cambodian youth group is working on oral history. They’re acting out stories which they hope to produce for public access television. A Vietnamese group has the same idea, and is working on the boat people experience. Because youth are such eager users, special hours have been set aside at the center to balance their enthusiasm with the need to provide adult access and training.

Often, learners are illiterate. Most must begin with English as a Second Language (ESL). Because language and culture are significant barriers, teaching computer skills can require a kinetic approach. To illustrate the idea that striking a key will produce a letter on the screen, Rhonda literally guides their hands with her own for the first hour of training. Once they get the idea, mouse technique is demonstrated, then real keyboarding. Later, 30 minutes of keyboarding practice is required at each sitting.

“It’s this one-on-one approach that makes the program so successful,” according to Rhonda. “Tutorial-based training can be relatively useless in such a diverse atmosphere.”

The center’s approach is unique and encourages building of relationships as well as computer skills. Learners “graduate” when they are able to teach others what they’ve learned.



Amy Young works on the Promoting Assets Across Cultures (PAAC) newsletter at the Rainier Vista Jobs Plus Computer Lab.

Education

The role that computers and the Internet should play in K–12 education remains a controversial issue. Building the computer and Internet literacy of youth is important to their ability to participate in future professional and civic endeavors, just as it is important for adults. However, many are not sure that computers should be introduced into the classroom without a better understanding of the usefulness and effectiveness of computer and the Internet as learning tools. A recent Associated Press poll found that American adults were about evenly split on the importance of Internet skills for students, with about half feeling they are very important and the other half saying they are somewhat or not at all important.⁴

Computers and the Internet in schools should be an aid to the educational process, integrated into the curriculum and used to advance academic standards, not a substitution for personalized instruction. The old approach of a computer lab where classes go to learn computers is being replaced by computers in the classroom, with the intention of creating a seamless integration of technology into lesson plans and classroom activities. Although this creates opportunities for more creative uses of technology, it also creates new challenges for teachers, who may not be trained in how to use computers and the Internet effectively.

This indicator seeks to measure the rate at which the Seattle Public Schools are reaching their goal of providing teachers with the tools they need to integrate technology into the classroom.



As a part of an approved technology levy, Seattle Public Schools has an aggressive technology plan in place to address the integration of computers into the

classroom: By January 1, 2003, 100% of the classrooms will have Internet access and 100% of the computers in the school will be connected to the Internet. Each school in the District is required to develop a technology plan defining how technology will fit in with the school's own goals for scholastic achievement. These plans help the schools to think about how technology can be used to advance academic goals. In an attempt to give

STATISTICS FOR THE SEATTLE SCHOOL DISTRICT AS OF DECEMBER 2000

Measure	As of August 2000	As of December 2000	District Goal
Ratio of computers that meet district standards to students	1:19	1:9	1:5 by the end of 2004
Percent of schools that are fully wired for high speed Internet access	60%	60%	100%
Percent of classrooms with Internet access	no data	63% of classrooms with at least one Internet connection	100%
Percent of computers connected to Internet	60%	76%	100%
Percent of schools with completed and approved technology plans	9.3%	27% (26 of 97)	100%
Percent of schools that offer industry certification courses	80% of high schools offer at least one (8 of 10)	80% of high schools offer at least one (8 of 10)	
Percent of principals that have been through SmartTools Training (as a proxy for technology leadership in schools)	80% (78 of 97 principals)	91% (88 of 97 principals)	100%

Source: Seattle Public Schools



Seattle Public Schools Technology Standards

1. Basic Operations and Concepts

- 1.1 Students demonstrate a sound understanding of the nature and operation of technology systems.
- 1.2 Students are proficient in the use of technology.

2. Social, ethical, and human issues

- 2.1 Students understand the ethical, cultural, and societal issues related to technology.
- 2.2 Students practice responsible use of technology systems, information, and software.
- 2.3 Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.

3. Technology productivity tools

- 3.1 Students use technology tools to enhance learning, increase productivity, and promote creativity.
- 3.2 Students use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works.

4. Technology communications tools

- 4.1 Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
- 4.2 Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.

5. Technology research tools

- 5.1 Students use technology to locate, evaluate, and collect information from a variety of sources.
- 5.2 Students use technology tools to process data and report results.
- 5.3 Students evaluate and select new information resources and technological innovations based on the appropriateness to specific tasks.

6. Technology problem-solving and decision-making tools

- 6.1 Students use technology resources for solving problems and making informed decisions.
- 6.2 Students employ technology in the development of strategies for solving problems in the real world.

students the opportunity to pursue higher level technology skills, some schools are offering industry certification classes. Principals are encouraged to attend SmartTools, training to help learn how to incorporate technology into the school's curriculum. This type of commitment at the leadership level indicates a commitment to smart and effective technology integration.

By measuring the school district's progress in relation to the goal defined by the technology levy we can track the progress as well as anticipate some of the upcoming needs of the district.

Overall Washington State schools are about average compared to other states for students per instructional computer (4.7) and students per Internet-connected computer (7.5) as of

the year 2000.⁵ In 1999, the state completed the K-20 Educational Network, a \$60 million network that links most of the state's 296 districts to the Internet, one another, and two- and four-year colleges with T1 lines. This has created opportunities for all students, regardless of the wealth of their district, to connect to distance learning and online Advanced Placement courses, and also allowed students to access the Internet from about 95% of the state's classrooms.⁶ This has helped to solve some of the technology inequities experienced by lower-income districts in other states.

However, according to Technology Counts 2001, published by *Education Week*,

Washington schools still have some important gaps to fill. For example, Washington is one of 24 states that do not have any technology requirements in place for teachers.⁷ Washington is also one of only 15 states that have not incorporated technology standards for students into their list of other core academic standards.⁸ Dennis Small from the Washington State Office of the Superintendent of Public Instruction comments that this is in part because individual school districts are encouraged to develop their own standards instead of using State-created standards.⁹

It is up to the educational pundits to come up with ways to infuse tech into their curriculums. Some will say "but it has not been proven that technology improves test scores and learning." I say that argument is now irrelevant. Here's why; the world these kids will work in will and is increasingly dependant on the many various uses of technology. This has nothing to do with scores, it is the way the competitive world our kids will compete in operates now.

—Currie Morrison, Retired Technology Instructor, Seattle Public Schools

Notes

- 1 Because of the range of times reported by residents, the median is actually used as the more reliable "average" in this section.
- 2 A number of reports on the use of computers and the Internet have come up with similar lists of most common uses. Some of those reports include The UCLA Internet Report: "Surveying the Digital Future," published by the UCLA Center for Communication Policy, *Falling Through the Net: Towards Digital Inclusion* published by the U.S. Department of Commerce, *The Pew Internet and American Life Project* (Internet Activities Chart, see http://www.pewinternet.org/reports/chart.asp?img=6_internet_activities.jpg), and *The Internet and Society Report* published by the Stanford Institute for the Quantitative Study of Society.
- 3 National Research Council, Computer Science and Telecommunications Board, *Being Fluent with Information Technology* (Washington, D.C.: National Academy Press, 1999) 2.
- 4 "Poll: USA split on use of Net in School," *USA Today*, August 20, 2001. Accessed at <http://www.usatoday.com/life/cyber/tech/2001-08-20-internet-schools-poll.htm>.
- 5 "Technology Counts 2001: The New Divides," *Education Week*, Volume XX, Number 35, 10 May 2001, 56-57.
- 6 *Ibid.*, 103.
- 7 *Ibid.*, 52.
- 8 *Ibid.*, 55.
- 9 Dennis Small in private conversation with Emily Bancroft on July 12, 2001.